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AUTHOR Arlin, Marshall; Palm, Linda
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ABSTRACT

This study examined five student characteristics with the expectation that if interactive characteristics could be established, attitudes could be improved by assigning students to classrooms with the appropriate degree of openness. It was hypothesized that some pupils might be happier in a traditional, or structured, environment. Five variables were hypothesized to interact singly and in combination with degree of openness: grade level, sex, intellectence, origence, and academic locus of control. Three studies were conducted. In the first study, four attitude instruments were administered to 1,000 open and 1,000 traditional pupils in grades 1-8. In the second study, Welsh's measures in intellectence and origence were administered to pupils from the previous sample in grades 4 and 6. In the third study, Crandall's measures of academic locus of control was administered to pupils in grades 4, 6, and 8 from the previous sample. Pupils in the open classrooms did not exhibit the expected more positive response toward teachers, did not perceive more freedom in the learning process, and exhibited lower attitudes toward mathematics and language arts. Results appear to indicate, however, that age is a significant interacting variable, and that more attention might be given at the upper grades to providing an open learning situation. (CS)

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THE INTERACTION OF OPEN EDUCATION PROCEDURES, STUDENT CHARACTERISTICS, AND ATTITUDES TOWARD LEARNING

Marshall Arlin and Linda Palm[1]

North Carolina Advancement School

Winston-Salem, North Carolina

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[1] After August 30, 1974, the following address applies: Department of Educational Psychology, The University of British Columbia, Vancouver, B. C., Canada. Thanks are expressed to Dr. Bruce Rogers, University of Maryland, for his help.ul critique of an earlier version of this paper.

The Interaction of Open Education Procedures,
Student Characteristics, and Attitudes Toward Learning

This study compares student attitudes in open and traditional classrooms but instead of asking, "Do students enjoy open education more than traditional education?", it asks, "What kinds of students enjoy open education and what kinds of students enjoy traditional education?" The study examined five student characteristics with the expectation that if interactive characteristics could be established, attitudes could be improved by assigning students to classrooms with the appropriate degree of openness.

Implicit in much of the literature on open education is the assumption that open education practices are associated with positive student attitudes toward school and learning. Some research (Stephens, 1974; Tuckman, 1974; Tuckman, Cochran & Travers, 1973; Weiss, 1973) supports this assumption but because of the slight differences observed and because of design limitations, the empirical evidence is not yet very persuasive. In addition, other studies have found affective characteristics of pupils in open classrooms to be the same as or lower than pupils in traditional classrooms (Burnham, 1973; Crandall, 1973; Fisher, 1974; Kohler, 1972; Scheirer, 1972; Traub, Weiss, & Fisher, 1972). Moreover, few, if any, of the studies have examined interactive

effects of student characteristics and attitudes toward open education.

In the non-empirical or descriptive literature, one finds many statements about the positive effect of open education upon student attitudes. Frequently, claims about the effectiveness of open education are made not so much in terms of academic outcomes but in terms of affective outcomes. Some observers (Blackie, 1967; Brown & Precious, 1969; Cazden, 1969; Featherstone, 1967; Plowden, 1967; Silberman, 1970) tend to portray traditional classrooms with students sitting at their desks drearily reading "the text" or listening to teacher lectures of limited interest or variety. These same writers describe the open classroom with students actively choosing their topics, moving freely about the room, using resources other than the teacher and text, and engaging in friendly, productive encounters with peers and teachers.

In the same manner, open education has been characterized by honesty of encounters, respect for persons, and warmth (Bussis & Chittenden 1970) or "humaneness" (Walberg & Thomas, 1971). There appears to be a considerable emphasis on praise and positive evaluation rather than negative evaluation (Dennison, 1969; Glasser, 1969). Moreover, observers of the

open classroom (Blackie, 1967; Silberman, 1970) frequently mention the ability of open educators to communicate trust and personal concern to their students. Although personal concern of teachers is not limited to open teachers, the emphasis on trust and friendliness is so salient in some reports (Barth, 1970; Rathbone, 1970) that it seems teacher and student affect is much greater in open classrooms than in traditional classrooms. Again, the empirical validation of these claims is somewhat inconclusive. Tuckman, Cochran, and Travers (1973) found open teachers to be more patient, gentle, accepting, warm, amiable, social, and fair than control teachers. However, a study by the present author (Horton, Arlin, & Pearson, 1974) found no significant difference between open and traditional teachers on expressed verbal affect.

Given the nature of the open program so described, it is surprising that the attitude differences between open and traditional students have been so minimal. It is suggested that one of the reasons for these minimal differences in attitude is that some children may prefer an open situation, whereas other children may prefer a more structured learning situation. Comparisons which combine all students may mask

the differential effect of the two educational methods upon pupils.

Three studies were conducted to test the hypothesis that there would be interactions between the type of educational treatment (open versus traditional) and several pupil characteristics.

Study I

The first two student characteristics examined were grade and sex. If Silberman's (1970) suggestion is correct, that "education for docility" characterizes American traditional schools, then boys may be less satisfied with traditional education than girls. Girls may be more satisfied with demands for keeping still, staying in one's seat, and docility. On the other hand, boys may be less docile, more in need of free physical movement, and consequently prefer an open approach. Further, there should be a greater distinction between the two approaches at the upper levels, as the traditional approach increasingly requires greater conforming behavior.

The hypotheses were formally stated in the null manner:

1) There will be no significant interaction of attitudes by openness by sex.

2) There will be no significant interaction of atti-

tudes by openness by grade.

3) There will be no significant interaction of attitudes by openness by sex by grade.

Method

Subjects

Subjects were students in classrooms of 80 teachers from a semi-rural county school system in North Carolina which has been actively pursuing open education programs for six years. Teachers were selected on the basis of principal ratings (described below). From a total population of 613 teachers in the county, 178 were nominated by their teaching. Supervisors of each teacher then rated the 178 teachers, and teachers not categorized similarly by both supervisors and principals were eliminated. One hundred sixty-one teachers remained after the supervisor ratings. Stratified random sampling was then used to obtain approximately five open and five traditional teachers at each grade level from first to eighth grade. The middle two grades (4 and 5) were oversampled to yield approximately equal numbers in grades 1-3, 4, 5, and 6-8. Forty teachers were chosen to represent excellent open teachers and 40 teachers were chosen to represent excellent traditional teachers. Twenty-eight

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teachers represented grades 1-3, 24 grades 4, 5, and 28 grades 6-8. The other independent variables were sex and grade level. Stratified random deletion removed approximately 80 subjects from over-represented groups leaving approximately 1,000 males, 1,000 females, 1,000 open, 1,000 traditional, and 666 subjects in grades 1-3, 668 in 4,5, and 666 in 6-8.

Instruments

Independent Measure:

1) Principal and Supervisor Rating Form. The criterion measure to determine the open and traditional teachers was drawn from Katz's (1972) work toward operationally defining open education. Katz proposed that open education could tentatively be defined in terms of nine continuous dimensions of classroom life. The proposed dimensions were use of space, use of time, activities of children, content or topics, origin of activity, initiation of teacher-child interaction, teaching target, child-child interaction, and emphasis on academic skills and standards. As open and traditional teachers were described by Katz as not differing in their emphasis on academic skills and standards, this dimension was deleted.

The adapted form consisted of Katz's eight dimensions, with each dimension being accompanied by a nine-point rating scale upon which the teacher was described by the principal for each dimension. Each scale ranged from +4 (very open) through 0 (mixed) to 4 (very traditional). Both sides of the scales were designated as positive to avoid assigning a negative evaluation to either teaching orientation. A sample item from the form is as follows:

	OPEN							TRADITIONAL
	FLEXIBLE			MIXED			FIXED	
1. Use of space	+4	+3	+2	+1	0	+1	+2	+3	+4

A short paragraph accompanied each dimension with a verbal description adapted from Katz (1972). Principals and supervisors were given the following set of instructions:

"Please check each item on this form for each teacher considered to be either traditional or open. It is important that teachers in both categories be excellent teachers to allow for a fair comparison. For teachers to be considered either open or traditional, they must score +2 or better on six items and must have a total score of +15 or more. The open score is computed by adding up all the

points to the left of the 0 and the traditional score is computed by adding up all of the points to the right of the 0. The 0 point indicates an even mixture of the two methods. The end points (+4) indicate very strong examples of the characteristics."

Dependent Measures:

2) Student Attitude Questionnaires. Four questionnaires developed at the North Carolina Advancement School (NCAS) were used to assess student attitudes. These were a) NCAS Attitude Toward Learning Processes (Arlin & Hills, 1974), b) NCAS Attitude Toward Teachers (Arlin & Hills, 1974), c) NCAS Attitude Toward Arithmetic (Arlin & Hills, 1974), and d) NCAS Attitude Toward Language Arts (Arlin & Hills, 1974). The instruments all contain 15 questions and are in a cartooned format. Corrected odd-even reliabilities are in the .80's for all the instruments and multi-trait, multi-method correlations and factor analysis with varimax rotation support discriminant validity for the instruments. A sample of an item from the instrument on learning processes is shown in Figure 1.

Insert Figure 1 about here

Results

Each item on each instrument was scored on a 0 (negative) to 10 (positive) basis. A total score for all fifteen items was computed for each subject for each instrument. These four total scores were transformed to a 0-100 point scale. A three-way analysis of variance was then performed on the data from each of the four attitude instruments. All analyses used casewise deletion, such that a subject missing any value (grade, sex, attitude score) was not included in the analysis. Harmonic means were computed to compensate for unequal cell sizes.

The analysis of attitudes toward the learning processes is presented in Table 1. The probability level for all tests of significance was set at .01.

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Insert Table 1 about here

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Surprisingly, the analysis revealed that open students did not perceive their schools as being more open, with greater opportunities for physical movement, choice of learning, and opportunity to work with classmates. Girls were more favorably disposed than boys, and attitudes decreased

sharply with grade level. In conformance with expectations, hypothesis 2 was rejected. There was a significant interaction of openness (open versus traditional) by grade such that the relative superiority of the open group became more pronounced at the upper levels. This trend was more pronounced for girls than for boys. Null hypothesis 3 was rejected by the significant three-way interaction but in contrast to expectations it was the girls rather than the boys who responded more favorably to the open procedures at the upper levels. In conformance with hypothesis 1, there was no interaction of openness by sex.

The analysis of variance for attitudes toward teachers is presented in Table 2.

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Insert Table 2 about here

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There was no significant difference between open and traditional classrooms. But, as above, girls had significantly more positive attitudes, and attitudes decreased sharply with grade level. In accordance with expectations, hypothesis 2 was rejected by a significant interaction of

openness by grade. The interaction was disordinal with traditional subjects more positive toward teachers at the lower levels and open subjects more positive toward teachers at the upper levels. In conformance with hypotheses 1 and 3, there were no significant interactions of openness by grade or openness by grade by sex.

The analysis of variance for attitudes toward arithmetic is shown in Table 3.

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Insert Table 3 about here

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As before, there was a sharp decrease of attitude with age, and girls exhibited significantly higher arithmetic attitudes than did boys. Also, the traditional group exhibited significantly more favorable attitudes toward arithmetic than the open group. In conformance with expectations, the three-way interaction between openness, grade, and sex was significant, rejecting hypothesis 3. In the open group, at the lower levels the girls exhibited lower attitudes than the boys, but this pattern reversed at the upper grades. In the traditional group, the opposite pattern prevailed, girls starting out relatively higher but at the upper grades,

[illegible] up relatively lower. Neither hypothesis 1 nor 2 was rejected because the two-way interactions were contained in the three-way interaction just described. There was a non-significant trend, however, indicating that arithmetic attitudes became relatively worse in the open group at the upper level.

The analysis of variance for language arts attitudes is shown in Table 4.

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Insert Table 4 about here

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As before, there was a sharp decrease with age level, and girls exhibited more positive attitudes. As with mathematics, subjects in the traditional group displayed more positive attitudes than subjects in the open group. In accordance with expectation, hypotheses 1 and 2 were rejected because of significant interactions between openness and sex and between openness and grade level. Although traditional subjects started out much higher than open subjects, the gap was closed by the upper levels, indicating that open attitudes toward language arts were becoming relatively more favorable with grade. Contrary to expectations, this pattern

was most pronounced for the girls. In conclusion, age appeared to be the most powerful interacting variable. Young pupils in this sample preferred traditional procedures, whereas older pupils preferred open teachers and open learning procedures but did not prefer open subject matter. In particular, mathematics attitudes seemed to suffer in open conditions at the upper levels. Those readers who wish to pursue these conclusions with a closer examination of subgroup means are referred to Table 5.

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Insert Table 5 about here

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Study II

The object of the second study was to examine two personality characteristics for possible interactive effects with degree of openness. The two characteristics were Welsh's (1959, 1969, 1972, 1973, 1975) dimensions of intellectence and origence. The nature of these variables and the reasons for their hypothesized interaction with degree of openness is described in the instrumentation section.

Method

Subjects

Subjects were upper elementary pupils who had participaged in the earlier study. Two weeks after the attitude testing session described in Study I, 483 fourth and sixth grade subjects responded to the intellectence and origence subscales of the Welsh Figure Preference Test. There was a roughly equivalent distribution of subjects by sex and by grade level.

Instruments

The principal rating form for classifying classrooms as open or traditional and the four dependent measures of attitudes have been described in Study I. Only the two new independent measures will be described here.

Independent Measures:

1) Origence. The measure for origence requires the respondent to examine each of 93 abstract figures taken from the Welsh Figure Preference Test (Welsh, 1959) and then to check a "like" or "don't like" response for each figure. According to Welsh (1972), those at the low end of origence prefer an explicit and well-defined world which can be grasped by the application of objective rules

Those at the high end prefer an implicit and open world which they can structure and order in their own subjective way. The high origent person resists conventional approaches that are pre-determined by others and would prefer to follow his own guidelines, even when they are unpopular or seem rebellious.

Pupils at the low end of origence would seem to be more at ease in a traditional classroom where problems can often be solved by conventional methods and by conforming to the status quo. The orderly, structured, and hierarchical environment of the traditional classroom should appeal to the low origent person who is characterized by such traits as deference to authority, persistence, planfulness, and self-effacement.

The high origent person, however, should feel cramped and constrained by the conventional classroom. He should thrive in an open environment which encourages independent study, personal responsibility for learning, originality, and imagination.

2) Intellectence. Intellectence is assessed by responding to 69 abstract figures from the Welsh Figure Preference Test, checking either "like" or "don't like."

Welsh (1972) describes intellectence as a dimension extending from the concrete to the abstract. At the low end of intellectence, empnasis is placed on literal and specific events which may be expressed in concrete terms and that may have practical or pragmatic applications for the usual experiences of life. The high end of intellectence is characterized by an abstract attitude and concern with figurative, symbolic expression and generalized principles of comprehension. The high, abstract, end tends to be more impersonal and unsocial in contrast to the low end which is much more directly personal and socially participative.

Traditional classrooms, with their concern for the verbal and abstract, would seem to provide an environment conducive to the high intellectent person. Moreover, the social patterns of the classroom are generally task-oriented and often isolated from peer interaction. This orientation should favor the high intellectent's impersonal, unsocial, and abstract tendencies.

On the other hand, open education while not neglecting the verbal, abstract aspects of education, puts a

greater emphasis on interaction with materials and concrete aspects of the environment. Further, it encourages the social, participative aspects of learning. Thus, the concrete, social characteristics of the low intellectent pupil should be well satisfied in an open situation.

In light of the presumed dimensions of origence and intellectence, the following three hypotheses were stated in null form:

Hypothesis 1: There will be no significant interaction of attitudes by openness by origence.

Hypothesis 2: There will be no significant interaction of attitudes by openness by intellectence.

Hypothesis 3: There will be no significant interaction of attitudes by openness by origence by intellectence.

Results

A frequency distribution was computed for both origence and intellectence, and the upper and lower 40% were designated as high and low representatives of that trait. Four 2 X 2 X 2 analyses of variance (open by intellectence by origence) were performed on the resulting

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data from the high and low groups. In contrast with expectations, none of the interactions were significant, so none of the hypotheses were rejected. The .01 level of significance was used, but the interactions failed to reach the .05 level of significance as well. Secondary analyses were conducted to determine if either intellectence or origence interacted with sex or grade, but again no interactions were observed.

Only two main effects out of a possible eight were detected for these two variables. The effect of intellectence upon language attitude was significant ($F_{1,287}=8.9$), but the effect was contrary to expectations. The low intellectence group had higher language attitudes than the high intellectence group. The effect of origence upon math attitudes was significant ($F_{1,238}=5.5$), but again the effect was contrary to that expected. The low origence group exhibited higher attitudes toward mathematics than the high origence group. Because of the lack of significance, none of the four tables are presented.

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Study III

The object of the second study was to examine the interactive effects of academic locus of control and degree of openness upon student attitudes. Academic locus of control represents the degree to which a pupil ascribes his school-related successes and failures to himself (internal) or ascribes them to some other factor such as teachers or luck (external).

It is hypothesized that the internal pupil is willing to take responsibility for his own learning and will feel positively toward a situation such as open education which places a premium upon self-initiated, self-sustained learning. On the other hand, it is hypothesized that the external pupil will feel positively toward a traditional situation where rules, demands, and expectations are clear and imposed by an external authority figure such as a teacher.

In addition, it was hypothesized that grade level and sex of the student might interact with academic locus of control. The preference of internals for open education was hypothesized to increase with grade level as a

consequence of a developmental movement toward increased autonomy and decreased dependence upon external authority figures. Further, it was hypothesized that boys might be less dependent than girls so that the internals' preference for open procedures might be more pronounced for boys. Girls could be equally as internal as boys, but internal girls might be able to tolerate and be satisfied with external teaching procedures to a greater degree than boys. For these reasons, the following hypotheses were formally proposed in the null form:

Hypothesis 1: There will be a significant interaction of attitudes by openness by academic locus of control.

Hypothesis 2: There will be a significant interaction of attitudes by openness by academic locus of control by grade level.

Hypothesis 3: There will be a significant interaction of attitudes by openness by academic locus of control by sex.

Method

Subjects

Subjects included the 483 fourth and sixth grade pupils described in Study II and an additional 227 eighth grade pupils. There was a roughly equivalent distribution of the 710 pupils across sex and grade. Pupils responded to the locus of control instrument two weeks after the attitude-testing session described in Study I.

Instruments

The four dependent measures of attitude and the principal rating form for classifying classrooms as open or traditional have been described in Study I. The instrument used to assess academic locus of control was the Intellectual Achievement Responsibility scale or IAR scale (Crandall, Katkovsky, & Crandall, 1965). The instrument consists of 34 forced-choice items such as, "When you do well on a test at school, is it more likely to be a. because you studied for it, or b. because the test was especially easy?" The respondent must check either a or b. Seventeen items assess negative IAR or willingness to accept personal responsibility for failure,

and 17 items assess positive IAR or willingness to accept personal responsibility for success. Answers are scored 0, for an external response, and 1, for an internal response. The resulting 0-34 range was converted to a 0-100 point range by a direct linear transformation as a convenience to yield equivalent ranges for the independent and dependent (attitude) measures.

Results

A cumulative frequency percentage distribution was computed for the 710 subjects. Subjects scoring in the upper and lower 40% were designated as high and low internals, respectively, or in a relative sense, as internals (N=269) and externals (N=264). Initial analysis of the data revealed no main effects or interaction effects due to grade level. Hypothesis 2 was thus not rejected for any of the attitude measures. A three-way analysis of variance, collapsing across grade levels, was performed (open X IAR X sex) for each of the attitude measures, with the significance level set at .05. Of the 533 IAR subjects, 419 were also coded by sex and were included in the final analysis.

The results of the analysis of variance for attitudes toward learning processes are given in Table 6.

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Insert Table 6 about here

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The analysis revealed a significant main effect for IAR, with the high IAR subjects indicating more positive attitudes toward school learning processes. There was also a significant interaction of openness by IAR, rejecting hypothesis 1. As expected, the high internals experienced a greater feeling of freedom about learning in the open setting, but there was no difference between internals and externals in the traditional setting. Although hypothesis 3 of the three-way interaction was not rejected ($F=2.0$), the trend was in the expected direction with the internals' preference for openness being more pronounced for boys than for girls.

The results of the analysis of variance for attitudes toward teachers are shown in Table 7.

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Insert Table 7 about here

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As expected, there was a significant main effect, with internals expressing higher attitudes toward teachers than externals. Also, as expected, there was a significant interaction of openness with locus of control, with internals being more satisfied with their teachers in open settings. Hypothesis 1 was thus rejected. Finally, hypothesis 3 was rejected because of the significant three-way interaction of IAR by sex by openness. As expected, the relatively higher attitudes of internals within open settings was even more pronounced among the boys.

Results of the analysis of variance for mathematics attitudes failed to reject any of the hypotheses. The main effect of IAR was significant at the .05 level ($F_{1,419}=4.8$), with internals being more positive toward arithmetic and mathematics. However, none of the other main effects or interaction effects were significant, and the anova table will not be presented.

Results of the analysis of variance for language arts attitudes also failed to reject any of the hypotheses. The main effect of IAR ($F_{1,419}=44.3$) and sex ($F_{1,419}=12.6$) were both significant at the .01 level, with higher attitudes

for internals and for girls. Since no other effects were significant, the anova table will not be presented.

In conclusion, the hypothesized interactions between attitudes, degree of openness, IAR, and sex were in general supported by the data from classroom-related attitudes (teachers and learning processes). On the other hand, the hypotheses were not supported by the data from the subject matter attitudes. The cell means for attitudes toward teachers and learning processes are presented in Table 8 to permit a more thorough analysis of the nature of these interactions.

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Insert Table 8 about here

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Summary and Conclusions

It is commonly assumed by proponents of open education that one of the benefits of this approach is increased student attitudes. The empirical literature in support of this assumption is inconclusive. It is possible that the inconclusive nature of the studies results from asking a question about the main effects of open education, or "Are attitudes

higher in open or traditional education?" The present study attempted to go beyond the typical study and ask an interactive question: "For what kinds of pupils are attitudes higher in open education, and for what kinds of pupils are attitudes higher in traditional education?" It was hypothesized that some pupils might be happier in an open environment, whereas other pupils would be happier in a traditional, more structured environment. Five variables were hypothesized to interact singly and in combination with degree of openness. These variables were grade level, sex, intellectence, origence, and academic locus of control. Four attitude questionnaires were administered to 1,000 pupils in open classes and 1,000 pupils in traditional classes, in grades 1-8.

Three studies were conducted. In the first study, four attitude instruments were administered to 1,000 open and 1,000 traditional pupils, in grades 1-8. In the second study, Welsh's measures of intellectence and origence were administered to pupils from the previous sample in grades 4 and 6. In the third study, Crandall's measure of academic locus of control was administered to pupils in grades 4, 6, and 8 from the previous sample. No significant results were found in Study 2.

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Significant main effects and interactive effects were found in Studies 1 and 3, and they are summarized starting with the main effects due to degree of openness:

1. Pupils in open classrooms do not perceive more freedom in the learning process than pupils in traditional classrooms (59 Vs. 59).

2. Pupils in open classrooms do not express higher attitudes toward teachers than pupils in traditional classrooms (69 Vs. 69).

3. Pupils in open classrooms exhibit significantly lower attitudes toward arithmetic than pupils in traditional classrooms (63 Vs. 68).

4. Pupils in open classrooms exhibit significantly lower attitudes toward language arts (reading) than students in traditional classrooms (68 Vs. 72).

5. Girls exhibit significantly higher attitudes than boys on all four attitudes (69 Vs. 64).

6. All four attitudes decrease significantly with age (73 Vs. 67 Vs. 58).

7. Age was a powerful interacting variable. There were significant interactions with grade level for all four

attitudes. For teachers, learning processes, and language, the attitudes in the open group became relatively better at the upper levels. For math, however, the pattern was the opposite, open attitudes becoming relatively worse at the upper grades.

8. For learning processes and arithmetic, the above trend (#7) was even more pronounced for the girls (a significant three-way interaction). Older girls liked open language and disliked open math. Otherwise, sex did not interact with degree of openness.

9. There was a significant interaction of academic locus of control and attitudes toward teachers and toward the learning process. Internal pupils exhibited higher attitudes when placed in an open environment. However, this interaction was not found with the two subject areas of reading and arithmetic.

In conclusion, further research is needed both to replicate these findings and to determine if the interactions are sufficiently large to provide guidelines for assigning pupils to open or traditional classrooms based on pupil characteristics. It would appear from this study that more

attention might be given at the upper grades to providing an open learning situation. At the younger grades, there seem to be minimal student attitude differences between excellent open teaching or excellent traditional teaching. This is not surprising. The present author has seen little evidence at the younger grades of the stereotype of traditional teaching--everybody fixed to their seat reading the same page at the same time. Rather, good teachers of both categories seem to provide sufficient opportunities for movement, for social interaction, and for enjoyable experiences with reading and with arithmetic.

If anything, at these younger grades, higher attitudes are exhibited in the traditional situation, perhaps suggesting that primary age children find a sense of security in a structured environment where rules, expectations, and subject matter learning are centered in the authority of the teacher. It is primarily at the upper grades that the open and the traditional treatments become distinguishable on a scale sufficiently large to affect student attitudes.

Although the results must be interpreted cautiously, they suggest that educational policy might be directed at

providing excellent open opportunities for students at the upper levels. Ironically, most of the open education intervention has been at the lower levels, levels at which this study indicates pupils are quite satisfied and secure with excellent, traditional teaching. Further, the study suggests that to increase student attitudes, it might be desirable to make an extra effort to provide internal pupils at the older grades with an open environment.

The major difficulty of this policy at the upper grades (4-6) is the need to improve or develop an arithmetic program appropriate to the open environment. The possible weakness of the open education mathematics programs may be unique to the mathematics teaching employed in the limited sample of this study. However, another study (Arlin, 1974) which compared attitudes in 400 open and 400 traditional pupils also found that math attitude was the only area in which open pupils were significantly lower. It is the impression of this writer that open teachers often leave the job of math teaching to programmed texts and individualized learning kits. It is probable that these kits do not have the intrinsic, self-sustaining quality described by

Westbury (1973) as crucial if materials are to serve as teacher surrogates. Until such materials are developed and validated in the classroom, caution might well be exercised in their implementation, in light of possible detrimental effects upon mathematics attitudes.

It is hoped that the results of this study have suggested some directions for policy and have stimulated interest in interactive aspects of future research into open education.

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References

Arlin, M., & Hills, D. NCAS Attitudes Toward Teachers, Published by the North Carolina Advancement School, Winston-Salem, North Carolina, 1974a.

Arlin, M., & Hills, D. NCAS Attitudes Toward Learning Processes, Published by the North Carolina Advancement School, Winston-Salem, North Carolina, 1974b.

Arlin, M., & Hills, D. NCAS Attitudes Toward Language Arts, Published by the North Carolina Advancement School, Winston-Salem, North Carolina, 1974c.

Arlin, M., & Hills, D. NCAS Attitudes Toward Mathematics, Published by the North Carolina Advancement School, Winston-Salem, North Carolina, 1974d.

Arlin, M., & Hills, D. Assessing Student Attitudes Through Cartooned versus Format: A multi-trait, multi-method validation. Educational and Psychological Measurement. In press. 1974e.

Arlin, M., & Palm, L. Development of an instrument to measure open education characteristics. Paper presented at the annual meeting of the National Council for Measurement in Education, Chicago, Ill. 1974.

00034

Barth, R. S. Open education: Assumptions about learning and knowledge. Unpublished doctoral dissertation, Harvard University, 1970.

Blackie, J. Inside the primary school. London: Her Majesty's Stationery Office, 1967.

Brown, Mary & Precious, N. The integrated day in the primary school. New York: Agathon Press, 1969.

Bussis, Anne M. & Chittenden, E. A. Analysis of an approach to open education. Princeton, N. J.: Educational Testing Service, 1970.

Cazden, Courtney B. Infant school. Newton, Mass.: Education Development Center, 1969.

Crandall, A. H. A comparison of reading attitude and reading achievement among first grade children in open concept and more formal classes. (Doctoral dissertation, University of Connecticut) Ann Arbor, Mich.: University Microfilms, 1973, No. 73 - 26, 572.

Crandall, V. C., Katkovsky, W., & Crandall, V. J. Children's beliefs in their own control of reinforcement in intellectual- academic achievement situations. Child Development, 1962, 33, 643-661.

Dennison, G. The lives of children: The story of the first street school. New York: Random House, 1969.

Featherstone, J. Schools for children: What's happening in british classrooms. The New Republic, August 19, 1967.

Fisher, C. W. Educational environments in elementary schools differing in architecture and program openness. Paper presented at the meeting of the American Educational Research Association, Chicago, April 1974.

Horton, P., Pearson, W., & Arlin, M. Teacher affect and reinforcement patterns of open and traditional teachers. Unpublished research report, N. C. Advancement School, Winston-Salem, N. C. 1974.

Kohler, P. T. A comparison of open and traditional education: Conditions that promote self-concept. Unpublished manuscript, University of Connecticut, 1972.

Plowden, Lady B., et. al. Children and their primary schools: A report of the central advisory council for education. London: Her Majesty's Stationery Office, 1967.

Rathbone, C. H. Open education and the teacher. Unpublished doctoral dissertation, Harvard University, 1970.

Scheirer, M. A. A study of the effects of open classroom education on children's achievement, self concepts and attitudes. (M.A. thesis, SUNY at Bingham), 1972, ED 085 423.

Scofield, N. C. (Ed.). Research previews. Issued by Institute for Research in Social Science, University of N. C. at Chapel Hill, 1972, 19, No. 1.

Silberman, C. E. Crisis in the classroom. New York: Random House, 1970.

Stephens, C. E. A multiple time sequence design applied to seventh grade student attitude toward school in two schools with contrasting organizational structure. Paper presented at the meeting of the National Council on Measurement in Education, New Orleans, February 1973.

Traub, R. E., Weiss, J., Fisher, C. W., & Musella, D. Closure on openness: Describing and quantifying open education. Interchange, 1972, 3 (2-3).

Tuckman, B. W. The differentiated outcome hypothesis or when will we stop using conventional achievement as the sole criterion for evaluating unconventional instruction. Paper presented at the meeting of the American Educational Research Association, Chicago, April 1974.

Walberg, H. J. and Thomas, Susan C. Characteristics of open education: Toward an operational definition. Newton, Mass.: Education Development Center, 1971.

Welsh, G. S. Welsh Figure Preference Test. Palo Alto, Calif.: Consulting Psychologist Press, Inc., 1959.

Welsh, G. S. Relationship of personality and classroom performance in talented students. Reprinted from The Proceedings of the Sessions on Gifted and Talented Children during the Twenty-First Annual Special Education Conference, Charlotte, N. C., November 1969.

Welsh, G. S. A two dimensional model for personality study. Paper presented at the annual meeting of the Southeastern Invitational Conference on Educational Testing. Roanoke, Virginia, December 1973.

Welsh, G. S. Adjective check list descriptions of Freud and Jung. Journal of Personality Assessment, 1975, 39, in press.

Westbury, Ian. Conventional classrooms, "open" classrooms, and the technology of teaching. Unpublished paper, Department of Education, University of Chicago, 1973.

00036

TABLE 1

Analysis of Variance for

Attitudes Toward Learning Processes (N=1947)

Source	df	MS	F
Grade	2	65680	157.9**
Open	1	140	
Sex	1	4646	11.2**
Open X Grade	2	8682	20.8**
Open X Sex	1	154	
Grade X Sex	2	1288	3.1*
Open X Grade X Sex	2	1316	3.2*

*$p < .05$ **$p < .01$

TABLE 2

Analysis of Variance for

Attitudes Toward Teacher (N=1947)

Source	df	MS	F
Grade	2	47499	165.1**
Open	1	1	
Sex	1	18371	63.9**
Open X Grade	2	3756	13.1**
Open X Sex	1	163	
Grade X Sex	2	1526	5.3**
Open X Grade X Sex	2	240	

**$p < .01$

00040

TABLE 3

Analysis of Variance for

Attitudes Toward Mathematics (N=1947)

Source	df	MS	F
Grade	2	47420	105.9**
Open	1	13763	30.7**
Sex	1	4476	10.0**
Open X Grade	2	627	
Open X Sex	1	632	
Grade X Sex	2	1821	
Open X Grade X Sex	2	3629	8.1**

**$p < .01$

TABLE 4

Analysis of Variance for

Attitudes Toward Language Arts (N=1947)

Source	df	MS	F
Grade	2	10798	34.3**
Open	1	5582	17.7**
Sex	1	26398	83.8**
Open X Grade	2	1827	5.8**
Open X Sex	1	1413	4.5*
Grade X Sex	2	376	
Open X Grade X Sex	2	709	

*$p < .05$ **$p < .01$

35642

TABLE 5

Cell Means of Attitude Scores:

Study I (N=160 per cell)

	Grade Level	Learning		Teachers		Math		Language	
		Open	Trad.	Open	Trad.	Open	Trad.	Open	Trad.
Male	1-3	65	72	73	78	71	74	68	74
	4,5	59	54	67	63	61	67	65	68
	6-8	49	50	58	58	50	61	59	65
Female	1-3	65	76	77	82	68	79	73	81
	4,5	65	61	76	73	71	71	76	74
	6-8	53	47	65	61	57	58	70	69

TABLE 6

Analysis of Variance for

Attitudes Toward Learning Processes (N=419)

Source	df	MS	F
IAR	1	4458	10.0**
Sex	1	14	
Open	1	12796	28.8**
Sex X IAR	1	66	
Sex X Open	1	1075	
Open X IAR	1	2814	6.3*
Sex X Open X IAR	1	883	

*p < .05 **p < .01

00041

TABLE 7

Analysis of Variance for

Attitudes Toward Teachers (N=419)

Source	df	MS	F
IAR	1	8716	26.4**
Sex	1	1165	
Open	1	7796	23.6**
IAR X Sex	1	120	
Open X Sex	1	65	
Open X IAR	1	2435	7.4**
IAR X Sex X Open	1	1304	3.9*

*$p < .05$ **$p < .01$

00845

TABLE 8

Cell Means for Attitudes:

Study 3 ($N \approx 52$ per cell)

	IAR	Learning Processes		Teachers	
		Open	Trad.	Open	Trad.
Male	Internal	69	46	77	59
	External	53	47	60	59
Female	Internal	63	52	77	68
	External	54	48	65	59

00046